

Discussion questions for Sediment Workgroup - Statistics

1. Define statistical questions.

We want to develop a list of objectives and questions to refine into well-developed statistical questions. Do these questions capture the areas where statistical analysis may be needed for human health and background at cleanup sites?

- A. Objective: After a cleanup site has been identified, **determine the constituents of concern** that need further investigation at that site.
 - i. How do you determine whether a chemical needs further investigation at a site (comparison of site data to screening levels)?
 - ii. How do you determine site boundaries that are distinct from background concentrations?
- B. Objective: **Determine cleanup standards** for a specific site.
 - i. What are cleanup levels based on “natural” background?
 - ii. What are cleanup levels based on “regional” background ?(if regional background becomes an option, and a policy definition of regional background is determined).
- C. Objective: **Determine compliance at a cleanup site.**
 - i. How do you determine compliance at a site for risk-based cleanup levels? (May have different scales for different exposure pathways and receptors).
 - ii How do you determine compliance at a site for background-based cleanup levels?

2. Tiered approach for statistical methods.

For statistical analysis of the questions developed in #1, would it be appropriate to develop statistical methods that depend on the size and complexity of the site? One example might be:

- Small sites – simple prescribed approach.
- Medium sites – toolbox of statistical methods, perhaps with a flow-chart or decision tree on which method to use for different situations.
- Large “mega” sites – “off-ramp” that allows site-specific statistical methods to be applied using statistical experts.

3. Background comparisons – point or population comparison. (Consider natural background and regional background separately)

- Under what circumstances do you want to use a point value out of the background dataset for comparison?
- If so, what point value is appropriate to use? (such as UCL on mean or 90th percentile)
- If not using a point value, what statistical tests (single or tandem tests) should be used to compare a site to background?

4. Comparison of site concentrations to risk-based cleanup levels – considerations of scale.

- Is it appropriate to use different scales and/or different statistical methods to compare site concentrations to a risk-based cleanup level, depending on the exposure pathway and receptor? (For example, using an area weighted average to compare a cleanup level based on human health exposure by eating fish, and a point-by-point comparison for benthic toxicity).